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INCOMPATIBILITY OF SLOVENIAN REGULATIONS IN THE FIELD OF WATER MANAGEMENT WITH EUROPEAN REGULATIONS AND RESULTING DAMAGE

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Abstract The issue of water management in Slovenia is regulated by several laws and by-laws. The right to drinking water is enshrined in the Constitution of the Republic of Slovenia. Individual by-laws in the field of water management are not coordinated with higher-level laws, the Constitution of the Republic of Slovenia, nor with EU regulations (directives, regulations). There are no relevant provisions in laws and by-laws that would enforce the right to drinking water enshrined in the Constitution. A major problem exists in the field of wastewater disposal and treatment, water protection, flood safety, etc. An even bigger problem, such as inconsistencies in regulations, is their poor implementation. This leads to excessive pollution and great material damage as well.

Keywords
water management, wastewater disposal, environmental, pollution, material damage, water quality legislative

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1 Introduction

The field of water management in Slovenia is not fully harmonized with the relevant EU regulations (directives, regulations, guidelines), and for the most part, not within Slovenian legislation either. The right to drinking water enshrined in the Constitution of the Republic of Slovenia (UL RS, 1991), which is not properly defined in the implementing regulations, stands out the most. Slovenian implementing regulations (by-laws, municipal spatial plans, *etc.*) have a significantly lower level of water protection than required by the EU Directives. This is particularly problematic in sensitive areas (karst areas, water protection areas, bathing waters, national parks, Natura 2000 areas, *etc.*). Inadequate water management causes major material damage and excessive environmental pollution every year.

2 Research methods

Slovenian and European regulations in the field of water management were studied. European environmental legislation is based on the precautionary principle and the principles of prevention or preventive action, elimination of environmental damage at the source, and liability of the polluter of environmental damage. The main framework for action in the field of environmental policy are multi-annual environmental action programs (EC, 2020). The directive on environmental liability with regard to the prevention and remedying of environmental damage (EU OJ, 2004) defines environmental damage to waters as damage that significantly affects the ecological, chemical, and/or quantitative status and/or ecological potential of the waters concerned within the meaning of Directive 2000/60/EC (EU OJ, 2000), with the exception of adverse effects where Article 4 (7) of that Directive applies.

In Slovenian legislation, environmental damage is generally regulated in the Environmental Protection Act (RS OJ, 2006) in Chapter V.a, titled Liability for the Prevention or Remediation of Environmental Damage. In addition, environmental damage is regulated in more detail in the Regulation on Types of Measures to Remedy Environmental Damage (RS OJ, 2009c) and in the Regulations on More Detailed Criteria for Determining Environmental Damage (RS OJ, 2009a). The regulation of environmental damage in Slovenian law is comparable to the national regulations of other Member States, as it concerns the implementation of the

Environmental Liability Directive. The principle of producer responsibility also applies in Slovenian legislation (EU OJ, 2004).

The Slovenian regulations covered were the Constitution of the Republic of Slovenia, laws, by-laws, the water management plan, municipal regulations, and municipal spatial plans. The identification of the situation in the field of water management in Slovenia emerged not only as a need for the preparation of this article but also as the result of the experience of ten years of work of one of the co-authors on the preparation of the Water Management Plan of the Republic of Slovenia. Among the European regulations, the survey covered EU directives and EU regulations in water management and guidelines in this field (BAT guidelines, standards referred to in the Slovenian legislation and the main ATV and VDI guidelines). The topic of water management, which the authors have dealt with as forensic experts and consultants, is also partially covered. The inconsistency of water management regulations with EU regulations is often reflected in court disputes. Some characteristic cases have been selected in which problems and ecological and material damage have arisen due to the inconsistency of Slovenian regulations with EU regulations.

3 Research

In the Constitution of the Republic of Slovenia (RS OJ, 1991), the issue of water management is dealt with in 70s and 70a. Article 70 (Public Good and Natural Resources) indirectly addresses the issue of water management. Article 70a (Right to Drinking Water) clearly deals with the supply of drinking water to the population, as follows:

- everyone has the right to drinking water,
- water resources are a public good managed by the State,
- water resources are used to supply the population with drinking water and water for household use and, in this respect, are not a market good,
- the supply of drinking water and water for household use to the population is provided by the State directly through self-governing local communities and on a non-profit basis.

The Water Act (RS OJ, 2002) does not adequately define the "right to drinking water". The Environmental Protection Act (RS OJ, 2006) addresses the field of water management in Article 149 (mandatory municipal public utility services for environmental protection) in the first paragraph as follows:

"(1) Mandatory municipal public utility services for environmental protection are:

1. drinking water supply,
2. drainage and treatment of urban wastewater and stormwater;
3. collection of certain types of municipal waste,
4. treatment of certain types of municipal waste,
5. disposal of residues from the recovery or disposal of municipal waste and
6. arranging and cleaning of public areas.

(2) The facilities and devices necessary for the performance of the public services referred to in the preceding paragraph are infrastructure of local importance.

(3) The Government shall specify:

1. the types of activities, municipal waste and tasks carried out within the scope of the public services referred to in the first paragraph of this Article,
2. the methodology for pricing, supply standards and technical, maintenance, organizational and other measures and criteria for the provision of the public services referred to in the first paragraph of this Article.

(4) The municipality shall ensure the provision of public services referred to in the first paragraph of this Article in accordance with the regulations referred to in the previous paragraph and the regulations governing public utility services.

(5) If the municipality does not ensure the provision of the compulsory public utility service referred to in the first paragraph of this Article, it shall be provided by the State on the territory of the municipality and on its account. The manner of provision shall be determined by the Government."

In the field of water management, municipalities are obliged to provide public services: supply of drinking water to the population and drainage and treatment of urban and stormwater runoff. The most common form of public service provision are public companies. This creates problems, the biggest of which arises in the drinking water supply. Municipalities, through public services, take care of the water supply to the population through public water supply systems. The right to drinking water enshrined in the Constitution applies to all citizens, regardless of whether they are supplied with drinking water from the public water supply system or from a private water supply system.

In Slovenia in 2019, 93% of the population was supplied with drinking water from drinking water supply systems or in 858 supply areas, where the quality of drinking water was monitored at the point of use, at the tap of the user. 7% of the population supplied from drinking water supply systems with less than 50 people or due to incomplete coverage were not included in the Drinking Water Monitoring. In cities, drinking water is usually supplied to all inhabitants, which is monitored (ARSO, 2021).

In Slovenia, despite many years of monitoring and reporting at the national level, data are still incomplete, inaccurate and not comparable. There is also a lot of confusion due to different organizations monitoring each of their parts, and it is impossible to reach overall results due to different measurement methods. Even at the EU level, statistical data are extremely deficient, with no data available in many countries (Jazbec, 2020). The discrepancy is most evident in monitoring the proportion of the population connected to the public water supply network. When preparing the Operational Program for Drinking Water Supply for the period from 2016 to 2021 (Government of the Republic of Slovenia, 2016), data from four different databases were used for the analysis of the public water supply network:

- settlement areas (RS MOP, 2006),
- cadastre of public infrastructure (RS GURS 2013),
- database of the Information System of Public Environmental Protection Services (IJSVO) (RS MOP, for 2014),
- drinking water supply programs for 2015 and 2020 (RS MOP, 2015).

Data of areas provided by municipalities could not be used as they were incomplete. Poor, insufficient and inadequate reporting is also reflected in the number of water supply connections which has fluctuated over the years. The number has stabilized at about 440,000 connections to the public water supply network (RS SURS, 2019).

With the synthesis of data, it was calculated that 88.6% of the total population in Slovenia is supplied from the public water supply system (1824677 inhabitants). 18 municipalities have 100% coverage, while 15 municipalities (where 2.48% of Slovenia's population lives) have less than 50% coverage. According to the collected data, 91% of the water supply network is younger than 50 years, and 48% of the total network is younger than 20 years. Assuming the lifetime of the water supply network is 30 years, a third of the water supply systems needs to be renovated. After 2005 and even more significantly, after 2009, the construction and renovation of water supply systems slowed down (Government of the Republic of Slovenia, 2016).

When synthesizing data from the IJSVO, ZKGJI and drinking water supply program databases, in case of divergent data, those from the drinking water supply programs that proved to be the most reliable were used (Government of the Republic of Slovenia, 2016).

The field of water quality intended for the supply of the population is dealt with in the "Act of health adequacy on foodstuff and products and substances that come into contact with foodstuff" (RS OJ, 2000) and in more detail in its implementing regulation: "Rules on Drinking Water" (RS OJ, 2004). Article 1 of the Rules states that it is in accordance with Council Directive 98/83 / EC of 3rd November 1998 on the quality of water intended for human consumption (EU OJ, 1998), as last amended by Commission Directive (EU) 2015/1787 of 6th October 2015 amending Annexes II and III to Council Directive 98/83/EC on the quality of water intended for human consumption (EU OJ, 2015). It sets out the requirements that drinking water must meet in order to protect human health from the harmful effects of drinking water pollution. However, it does not mention the manner in which the right to drinking water enshrined in the Constitution is exercised. This right applies to all citizens and not only to those supplied by public water supply systems. Article 4 of the Rules states that: "These rules do not apply to drinking water from drinking water supply systems that supply less than an average of 10 m3 of water per day or supply less than 50 people, which the inhabitants must be informed about by the

local community unless the water is used to supply public facilities, facilities for the production and marketing of food and facilities for the packaging of drinking water".

In Slovenia, the population is supplied mainly from groundwater (RS SURS, 2019). Therefore, it is very important to protect groundwater adequately. This is especially important for the approximately 150,000 inhabitants who are supplied from their own water catchments. State monitoring of drinking water quality based on the "Rules on Drinking Water" (RS OJ, 2004) is not conducted for these water catchments. In all public water supply systems, there is at least a minimum technology for drinking water treatment that ensures its health safety. This must also be evident from the HACCP study (Zagorc, 2015) that must be prepared for each public water supply system. However, there is no public control over the quality of water in water catchments that are not part of the public water supply system.

Groundwater can be protected mainly by preventing its excessive pollution (Drev, Panjan, 2012; Drev, Panjan, 2013). This can be ensured through efficient drainage and treatment of wastewater and effective implementation of the Rules of Good Agricultural Practice (RS OJ, 2004). The Regulation for the Protection of Waters against Pollution by Nitrates (RS OJ, 2009b) can be considered as an operational program for the implementation of measures to reduce nitrogen inputs to the soil according to the Nitrates Directive (EU OJ, 1991). The Water Framework Directive (Directive 2000/60/ EC) deals with a comprehensive water management policy. All directives in the field of water management are subordinated to this directive (Drinking Water Directive, Urban Wastewater Directive, Bathing Water Directive, Nitrate Directive, Floods Directive, Groundwater Directive, Habitats Directive, *etc.*). The Regulation on the Water Management Plan for the Danube and Adriatic Water Territory (Official Gazette of the Republic of Slovenia, No. 61/11, 49/12 and 67/16) largely implements the requirements of the Water Framework Directive 2000/60/ EC.

It is totally inappropriate to consider only the requirements of Directive 91/271/EEC on drainage and treatment of urban wastewater of 1991 and not the requirements of all other directives in the field of water management. The Water Framework Directive 2000/60/ EC requires water management to take into account the requirements of all directives, giving priority to the supply of drinking water to the population (Directive 98/83/ EC and Directive 2015/1787/EU). Looking at

Slovenian Regulations in the field of urban wastewater drainage and treatment (RS, 2015), we can see that they are almost exclusively adapted to the requirements of Directive 91/271/EEC and its amendments in Directive 98/15/EC. These requirements are intended to protect water bodies (rivers, lakes, sea, groundwater) from nutrient pollution. Only in the case of medium and large municipal wastewater treatment plants (RS OJ, 2015) they also meet the requirements of Bathing Water Directive 2006/7/EC (EU OJ, 2006). However, all other requirements of the directives in the field of water management (Drinking Water Directive (EU OJ, 1998), Habitats Directive (EU OJ, 1992), *etc.*) are not met by Slovenian regulations. The situation is even worse for small municipal wastewater treatment plants with the Regulation on the emission of substances in wastewater disposal from small municipal wastewater treatment plants (RS OJ, 2007). Slovenian regulations in the field of wastewater disposal and treatment do not take into account additional requirements (karst territories, water protected areas, national parks, bathing water catchment areas, Natura 2000, *etc.*).

If the requirements of the general "Regulation on the Emission of Substances and Heat in the Discharge of Wastewater into Waters and the Public Sewerage System" (RS OJ, 2012) were fully met, the sensitive Slovenian aquatic environment would be relatively well protected. However, specific regulations for individual economic activities have a number of deductions in contrast to the general regulation. This applies to the operation of municipal wastewater treatment plants and other sources of pollution. For example, for municipal wastewater treatment plants with a capacity of 2000 or more PE, only carbon, nitrogen and phosphorus pollution are measured. However, all other pollutants from the general regulation are not measured. Carbon pollution is measured indirectly through COD (chemical oxygen demand) and BOD5 (five-day biochemical oxygen demand). For small municipal wastewater treatment plants up to a size of 50 PE, only COD is measured. For example, the "Regulation on the Emission of Substances and Heat in the Discharge of Wastewater from Manufactures for the Production and Treatment of Iron and Steel" (RS OJ, 2007) requires measurements of eight different metals (Cu, Zn, Sn, Cr2 +, Cr6 +, Pb and Fe), which is clearly insufficient. Nickel (Ni), cobalt (Co), manganese (Mn), wolfram (W), vanadium (V), titanium (Ti), aluminum (Al), antimony (Sb), *etc.* are also very important components of stainless steels but are not considered by the regulation. The manufacture of enameled products (dishes, white goods, *etc.*) is not possible without the use of boron compounds (borax) which are also not taken into

account in this regulation. This clearly shows how deficient the by-laws in the field of water pollution are. However, all possible parameters to be expected are listed in the general regulation, which is fully harmonized with the relevant EU regulations and directives. If monitoring is not carried out properly, the state of control will deteriorate. Inadequate control is also possible, in large part because of a very poor by-law that addresses this issue (Rules on Initial Measurements and Operational Monitoring of Wastewater (RS OJ, 2014)). The rules require that the initial measurements and operational monitoring are carried out according to accredited methods, while the measurements are carried out by accredited laboratories. However, it is not clearly defined where and when sampling and field measurements should be carried out. Some of the largest polluters are even allowed to carry out their own monitoring. In our opinion, this does not comply with the requirements of ISO 17025. In a study we conducted years ago, it was found that about 30% of the annual reports on operational monitoring of wastewater are not relevant (Drev, Panjan, 2009).

Insufficiently treated wastewater (municipal, technological) causes excessive pollution and, as a consequence, great material damage. For example, if technological wastewater was properly treated before being discharged into the public sewerage system, there would be no excessively polluted sludge in municipal wastewater treatment plants. Such sludge, after proper treatment, could be usefully applied for agricultural purposes (compost, various soils) or for energy use. Dried sewage sludge from municipal wastewater treatment plants with a dry matter content of at least 90% has about the same calorific value as lignite. However, if it is excessively contaminated with heavy metals and AOX compounds, it is not suitable for composting or for processing into fuel. Such sludge is a waste that does not bring any profit but causes high costs for its disposal. The management of most Slovenian municipal wastewater treatment plants, as well as the Ministry of Environment and Spatial Planning, are currently dealing with this problem, as a major problem has arisen with the export of such waste.

3.1 Examples from forensic expert opinion and valuation practice

Under the Judicial Conduct Act (RS OJ, 2007) and the Regulations on Forensic Experts, Court Valuators and Court Interpreters (RS OJ, 2018), forensic experts and valuators are also involved in court proceedings. The following are some examples from the field of water management in which the authors of this article have been involved.

Example 1:

A small municipal constructed wetland (1000 PE) excessively pollutes the environment and endangers the health of the surrounding population. At least 10 residential buildings are less than 150 m away from the constructed wetland. The fact that this plant could be placed so close to the settlement and in the water-protected area, was opposed by the inhabitants of the surrounding settlements already in the planning phase. The local policy and state bodies (administrative unit, ARSO, *etc.*) did not meet the requirements of all applicable Slovenian regulations in the field of water management sufficiently but met only the minimum requirements of the Ordinance on the Emission of Substances in the Discharge of Wastewater from Small Municipal Wastewater Treatment Plants (RS OJ, 2007). Since the Construction Act (RS OJ, 2017) does not explicitly require compliance with the relevant engineering guidelines for the construction of municipal wastewater treatment plants, the wetland area was dimensioned 50% smaller than it would have to be according to the relevant German or Austrian guidelines (DWA A 262 (DWA, 2017) and ÖNORM B 2505 (Austrian Standards, 2009). The construction permit shows that the total area of the wetland is 2540 m^2. With such an area, according to German (DWA A 262) and Austrian guidelines (ÖNORM B 2505), it is not possible to effectively treat the wastewater of 1000 inhabitants (1000 PE). Table 1 shows that for a horizontal flow constructed wetland, at least 5 m^2/PE and for a vertical flow constructed wetland, at least 4 m^2/PE are required.

Such a wastewater treatment plant does not operate efficiently enough, so it does not meet the Slovenian requirements for the operation of small municipal wastewater treatment plants. Some measurements published in the annual reports on the operation of the constructed wetland did not comply with the regulations. Microbiological treatment was required in the construction permit because the plant

is located in a water-protected area. However, microbiological analyses were never carried out.

For the operation of small municipal wastewater treatment plants of 1000 PE, the Slovenian ordinance only requires that the effluent of COD does not exceed 150 mg O_2/l and BOD_5 does not exceed 30 mg O_2/l. Since the small municipal wastewater treatment plant under consideration is located in the vicinity of residential buildings, a completely different wastewater treatment technology should be chosen (*e.g.*, a membrane wastewater treatment plant with three-phase waste gas scrubbing). The treated wastewater flows into a stream in the Natura 2000 site. Therefore, a much stronger purification of the wastewater would be required. Microbiological treatment and efficient removal of nitrogen and phosphorus compounds should also be provided. In addition, a small municipal wastewater treatment plant is located in a water-protected area from which a nearby relatively large public water supply system is supplied. There is a suitable area approximately 500 meters from the existing site, which is much more favorable. However, if it is determined that this is the only feasible location for a small municipal wastewater treatment plant, more efficient technology should be used. The public utilities that operate the small municipal wastewater treatment plant, the municipality, and the relevant state institutions have not responded adequately. The local population feels disturbed by the odor emissions from the small sewage treatment plant and the poorly treated wastewater and is seeking its rights through the courts. To facilitate the process, the local population decided to file a claim for damages. Because of the legal dispute, they needed an expert and valuator's report.

Example 2:

The local water supply system has become unusable due to excessive water pollution by chemical and microbiological parameters. A criminal complaint was filed against an unknown polluter. There was a reasonable suspicion that someone was pouring slurry on the water-protected area, contaminating the water source of the local water supply system. The police carried out some investigative measures. The Regional Institute of Health Care took samples and analyzed them. E. coli bacteria (5/100 ml) and coliform bacteria (10/100 ml) were present in the water, as well as ammonium (10 mg/l). In considering the criminal case, the court noted that it needed the input of an ecological expert. The pollution of the water catchment area and the ecological

damage were mainly caused by the discord of Slovenian regulations with EU regulations in the field of water management. The main problem, in this case, was also that the "right to drinking water" enshrined in the Constitution of the Republic of Slovenia is not included in the Slovenian regulations in the field of water management. The right to drinking water enshrined in the Constitution should be implemented in the relevant laws and by-laws. For this purpose, an inter-ministerial commission was established years ago to draft proposals for appropriate regulations. No experts in the field of sanitary engineering sat on this commission.

Example 3:

A small municipal wastewater treatment plant of size 9 PE reaches up to 200 mg O_2/l at the outlet of COD, as required by the Ordinance on the emission of substances in the discharge of wastewater from small municipal wastewater treatment plants (RS OJ, 2007). Nevertheless, excessive pollution of the environment and endangerment of human health occurs. The small municipal wastewater treatment plant emits a stench that disturbs local residents and endangers their health. There is also a small water reservoir nearby that does not have the status of a public water supply. The water from the small municipal treatment plant poses a serious threat to the water catchment area, especially as it is located in a karst area. Although Slovenia has not yet adopted a regulation on the emission of unpleasant odors into the environment, this does not mean that the emission of unpleasant odors into the environment is allowed. The same applies to the pollution of water bodies for the needs of water supply, karst protection, bathing waters, Natura 2000, *etc.* The right to drinking water enshrined in the Constitution also applies to those residents who are supplied from water catchments that do not have the status of a public water supply system. Affected citizens needed the expert and valuator's opinion of the ecological profession to enforce their rights in court.

Example 4:

A large central municipal sewage treatment plant produces a large amount of sewage sludge. This sludge dries properly, leaving less than 10% water in the sludge. Although the dried sludge has about the same calorific value as lignite, it is not used for thermal utilization but is treated as waste. The main reason for this is the occasional over-contamination of the sludge with heavy metals. If all industrial

pollutants would meet the prescribed criteria of the general "Ordinance on the Emission of Substances and Heat in the Discharge of Wastewater into Waters and Public Sewerage Systems" (RS OJ, 2012), this would not be the case. This may be due to compliance with the criteria of other specific regulations that have more lenient criteria and the lack of implementation of wastewater monitoring when discharging wastewater into public sewers. Similar problems occur at most large wastewater treatment plants in Slovenia. So far, the sewage sludge from the central treatment plants has been treated exclusively as waste and exported abroad (mostly to Hungary) at a high cost.

4 Experiences with litigation from some other countries

4.1 The Republic of Austria and the Federal Republic of Germany

Individual cases in the other EU Member States also frequently end up before the Court of Justice of the EU. In the article, some cases in the jurisprudence of the Court of Justice of the EU for which data on environmental damage to water bodies are available and which involve parties from Austria and Germany were reviewed and analyzed. It was found that there are also inconsistencies, especially in the decisions issued for the construction of individual facilities and the regulation of watercourses under the Water Framework Directive (EU OJ, 2000). It happens that courts at the national level of individual members ask the Court of Justice of the EU to clarify certain issues and interpretations. Some examples are summarized in the literature, such as Butinar, Ž., et al.: "Identification and remediation of environmental damage under the rules of national, European and international law".

4.2 Analysis of legal acts and water management in the Czech Republic

In recent history, the Czech Republic has had similar state arrangements as the Republic of Slovenia - both countries are former socialist states. Two countries, the Czech Republic and the Slovak Republic, emerged from the former state of Czechoslovakia. Temporally, these events coincide with the independence of Slovenia. Therefore, we can compare the course and development of legislation in the field of water legislation. The study "Analysis of legislative acts in water management" (J. Nesiba, R. Cuhlova, 2021) presents the water legislation of the Czech Republic for three periods (1990-1992, 1993-2003 and 2004-2019).

The period from 1990 to 1992 is known as the Crisis Management Phase. This period required a fundamental change in the approach to water protection. New legislation was quickly proposed that represented a complete change in the approach to water pollution control. Crisis management is defined as the identification of threats to an organization and its stakeholders and requires decisions to be made within a short time frame. In 1990-1992, a political representation, a citizens' movement and a specialized institution for nature protection were established. After an inadequate approach of the socialist government, pressure arose on water protection standards in Czechoslovakia. Many laws, regulations or restrictions were created to replace the unsatisfactory socialist standards.

In the Operational Management Phase (1993-2003) preceding the establishment of the independent Czech Republic (1.1.1993), the Czech Constitution directly stated that this supreme law protects natural resources and their careful use (Czech Republic Act No. 1/1993). The Charter of Fundamental Rights and Freedoms of the Czech Republic states that everyone has the right to a favorable environment and the right to comprehensive information on the state of the environment and natural resources (Czech Republic Act No. 2/1993). A new conceptual direction of nature and water protection began to emerge. This approach can be called operational management, which is generally capable of rapid changes. Operational management involves coordinating and developing new processes while re-evaluating existing structures.

The advent of strategic management (2004-2019) refers to long-term planning. An important factor of strategic management is the precise setting of goals and time frames. Common to all strategic management is that it defines objectives and how they are to be achieved.

5 Discussion

Other examples can be found where the inadequate and partial application of the law causes environmental problems that degrade the condition of water in nature and negatively impact human health. By aligning the implementing regulations with each other and aligning them with higher-level legislation, many of the problems that exist today could be avoided. In many cases, it would also be possible to reuse water

and substances separated from wastewater. This would bring us much closer to the goals of the circular economy.

Due to the inconsistency of Slovenian regulations in the field of water management with EU regulations, the environment in Slovenia is excessively polluted every year, causing great material damage. This is most pronounced in sensitive areas such as: karst land, Natura 2000 areas, national parks, bathing areas, shellfish breeding areas, water protected areas, *etc.* For example, a small wastewater treatment plant has been established on one of the mountain huts in the Triglav National Park. It operates in accordance with Slovenian regulations, which are not fully in line with EU regulations. This small municipal wastewater treatment plant meets the prescribed COD criterion of 200 mg O_2/l. Reaching this criterion does not prevent excessive environmental pollution. As a result of excessive pollution, one of the Triglav lakes is polluted. Remediation of this lake is possible only in this way to prevent its pollution. Excessively polluted water with COD, BOD_5, nitrates, phosphates and microorganisms also threatens the surrounding habitat and human health. Unpleasant odors composed of NH_3, H_2S, mercaptans and thiophenes, are also disturbing to the environment and humans. In the drainage and treating of municipal wastewater, the Slovenian implementing regulations, the Ordinance on the emission of substances in the discharge of wastewater from municipal wastewater treatment plants (RS OJ, 2007) and the Ordinance on the emission of substances in the discharge of wastewater from small municipal wastewater treatment plants (RS OJ, 2007) should not be limited to the requirements of the EU Directive on urban wastewater treatment from 1991 (EU OJ, 19991), but should take into account the requirements of other directives in the field of water management (Drinking Water Directive, Bathing Water Directive, Nitrate Directive, Habitats Directive, *etc.*). This is required by the Water Framework Directive (EU OJ, 2000).

If adequate drainage and treatment of municipal and industrial wastewater were ensured and the produced sludge was treated in accordance with the Waste Framework Directive (EU OJ, 2008), Slovenia would not have such a big problem with sludge from wastewater treatment plants. For example, for the sufficiently large central wastewater treatment plants, digestion and energetic use of biogas (heat and electricity generation) would be economically justified. The rest of the sludge, which would be sufficiently mineralized, would then be processed into various soils for agricultural use.

If the effluents of the Koper Central Wastewater Treatment Plant, the Piran Central Wastewater Treatment Plant and many other wastewater treatment plants located in sensitive areas were microbiologically purified, excessive environmental pollution could be prevented. Purified water could be used for technological, sanitary and agricultural purposes. This would significantly reduce the need for fresh water for industry and agriculture. This is especially important on the Slovenian coast, where there is a severe shortage of fresh water in summer. Now, treated wastewater from central wastewater treatment plants flows into the sea, endangering the quality of bathing waters in the natural environment and the production of shellfish.

Compliance with the requirements of EU directives in the field of water management would not increase the cost of wastewater collection and treatment systems. The useful use of treated water and the produced sludge would represent a great material benefit. For example, the Novo Mesto Central Wastewater Treatment Plant, because it has a very efficient wastewater treatment system (membrane biological reactor), is no more expensive than the classic technology, which is not as efficient. The cost of its operation is not higher than the classical technology, which is about the same size as the Koper Central Wastewater Treatment Plant.

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Appendix

Table 1: Overview of the requirements of DWA guideline A 262 for constructed wetlands

plant filter/criterion	<50 PE	50 – 1.000 PE
horizontal filter		
total filter area	≥ 5 m^2/PE	
minimum area	≥ 20 m^2	
hydraulic load at mean daily dry flow	≤ 40 mm/d or ≤l/(m^2.d)	
biologically effective layer	≥50 cm	
BOD surface load		≤16 g/(m^2.d)
vertical filter		
minimum area	≥ 16 m^2/PE	
hydraulic load at mean daily dry flow	≥80 l/(m^2.d)	
biologically effective layer	≥50 cm +≥20 cm	
layer with the mass transfer	≤5 m^2	
specific area	≥4 m^2/PE	≥4 m^2/PE
BOD surface load		≤20 g/(m^2.d)